

4 ALTERNATIVES

4.1 INTRODUCTION

CEQA Guidelines section 15126.6(a) requires that an EIR describe “a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects, and evaluate the comparative merits of the alternatives.” The range of alternatives considered in an EIR is governed by the “rule of reason,” requiring evaluation of only those alternatives “necessary to permit a reasoned choice” (CEQA Guidelines section 15126.6[f]). Furthermore, an EIR “need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative” (CEQA Guidelines section 15126.6[f][3]). The analysis should focus on alternatives that are feasible (i.e., that may be accomplished in a successful manner within a reasonable period of time) and should consider economic, environmental, social, and technological factors. Alternatives that are remote or speculative should not be discussed. Furthermore, the alternatives analyzed for a project should focus on reducing or avoiding significant environmental impacts associated with the project as proposed (CEQA Guidelines section 15126.6[b]).

4.1.1 SIGNIFICANT EFFECTS OF THE PROPOSED PROGRAM

Impacts associated with the SERP are evaluated in Chapter 3, “Environmental Impact Analysis,” of this DEIR. For comparison with the alternatives described in this chapter, Table 4-1 provides a summary of SERP impact levels before and after implementation of mitigation for the six environmental resources evaluated in detail in this DEIR. For each resource, the table indicates whether the SERP would result in an overall less-than-significant impact, potentially significant impact, or significant impact, and whether the overall impact could be reduced to a less-than-significant level through mitigation or would be significant and unavoidable. As shown in this table, significant impacts are not anticipated for biological resources; geology, soils, and paleontological resources; or hydrology and water quality. In addition, mitigation would reduce potentially significant and significant impacts on air quality and climate change, cultural resources, and noise to less-than-significant levels.

4.2 ALTERNATIVES CONSIDERED AND REJECTED FROM FURTHER CONSIDERATION

Under CEQA, feasible alternatives should be considered that would avoid or substantially reduce any of the significant effects of the proposed project and attain most of the project objectives. Furthermore, CEQA requires that an EIR should briefly describe the rationale for selecting the alternatives to be discussed and briefly explain the reasons underlying the lead agency’s determination for rejecting alternatives including: failure to meet most of the basic

Table 4-1
Summary of Impact Levels Before and After Mitigation

Environmental Resource	Before Mitigation	After Mitigation
Air Quality and Climate Change	Significant	Less than significant
Cultural Resources	Potentially significant	Less than significant
Biological Resources	Less than significant	Less than significant (no mitigation required)
Geology, Soils, and Paleontological Resources	Less than significant	Less than significant (no mitigation required)
Hydrology and Water Quality	Less than significant	Less than significant (no mitigation required)
Noise	Potentially significant	Less than significant
Source: Compiled by AECOM in 2011		

project objectives, infeasibility, or inability to avoid significant environmental impacts (CEQA Guidelines section 15126.6[c]).

4.2.1 SERP SUBCOMMITTEE DESIGN ALTERNATIVES

The SERP Subcommittee was established at the direction of the Interagency Flood Management Collaborative Program Group (referred to here as the Interagency Collaborative Group) on January 17, 2007. The Subcommittee consists of federal and state resource agency representatives, charged with defining what constitutes a small erosion repair and determining appropriate repair designs to adequately protect the levee system while avoiding substantial adverse effects on environmental resources. The SERP Subcommittee has crafted a program that is intended to improve current erosion repair practices, and thus maintain the necessary level of flood risk reduction while seeking to achieve a cumulative net benefit to aquatic and terrestrial fish and wildlife resources, including habitat for sensitive species. As a result of the cooperative efforts of the SERP Subcommittee, the proposed program gradually evolved, without a formal process of developing, and then accepting or rejecting, complete program alternatives.

Various issues and criteria that are now reflected in the SERP Manual, such as size and characteristics of projects qualifying under the SERP, were evaluated, considered, and ultimately accepted by the SERP Subcommittee. In addition, a wide range of erosion repair designs that would provide the necessary level of flood risk reduction were evaluated. The SERP Subcommittee focused on design alternatives that would incorporate bioengineering practices and thereby provide for self-mitigation opportunities for levee maintenance projects.

These were designs that have been successfully applied along California waterways by various public flood risk reduction and transportation agencies.

In April 2007, DWR provided the SERP Subcommittee with 13 potential erosion repair design templates that met the program objectives and would be potentially applicable to the SERP. In subsequent SERP Subcommittee meetings, these templates were reviewed and discussed for their potential use under the SERP program. The templates were evaluated based on factors including applicability of design to the type of levee damage, long-term maintenance requirements, wildlife hazards, aesthetics, degree of installation difficulty, adequacy of potential vegetation coverage area, and DWR levee vegetation management standards and inspection criteria. Several design alternatives were eliminated from further consideration during this process. One design template, full turf matting, was eliminated because of the potential for the structure to entrap wildlife. A few design templates that used concrete materials in various ways, such as cellular blocks and gabion baskets, were eliminated due to the high cost of maintenance and the potential for these structures to limit growth of vegetation. One other design template was modified to incorporate language from another template so that it would capture both in a single template. In the end, five of the thirteen design templates scrutinized by the SERP Subcommittee were eliminated from further consideration, and a total of seven design templates were incorporated into the proposed program to be used depending on the nuances of each erosion site.

4.2.2 SECTION 404(b)(1) DESIGN ALTERNATIVES

In addition to the design alternatives discussed above, two more design alternatives, a fully bio-engineered (no rock) erosion repair design and a fully hard-bank (all rock/concrete) erosion repair design, were evaluated in the section 404(b)(1) Alternatives Analysis (DWR 2012). Neither of these design alternatives has been carried forward into the PEIR analysis, however, because they would be contrary to the public interest and would not meet the purpose and objectives of the SERP.

The section 404(b)(1) analysis concluded that the fully bio-engineered erosion repair design would not feasibly satisfy the program objectives because (1) the repair site would be exposed to further erosion during the plant establishment period, (2) fully bio-engineered structures would not perform well on slopes greater than 2:1 (H:V), and (3) fully bio-engineered structures are not suitable at repair sites along high-order streams where erosion forces are high and critical infrastructure is at risk (USACE n.d.), which is generally the case within the SERP coverage area. The analysis also concluded that the fully hard-bank erosion repair design would not meet program objectives because use of fully hard-bank structures to repair erosion sites would require compensatory mitigation off-site rather than self-mitigating on-site through the project design templates developed by the SERP Subcommittee. Furthermore, it is uncertain whether the full array of biological functions and services impacted at repair sites

with fully hard-bank structures could be fully offset through restoration or enhancement efforts in the project vicinity or even in the same watershed.

4.2.3 OFF-SITE ALTERNATIVES

Typically, alternative sites to a proposed project are considered under CEQA and in section 404(b)(1) alternatives analyses. For SERP, however, flood protection must be provided at the location of the potential flood risk, which is at erosion site along the Sacramento River and its tributaries identified as SERP Waterways. Erosion repairs must take place where the erosion has occurred and presents the greatest risk for flooding. As a result, erosion repairs cannot feasibly achieve the program objectives unless undertaken at the specific erosion sites where potential flood risk is highest. For this reason, alternative sites for the program's erosion repair activities are infeasible and are not evaluated further.

4.3 DESCRIPTIONS AND ANALYSIS OF THE PROGRAM ALTERNATIVES

4.3.1 DESCRIPTION OF PROGRAM ALTERNATIVES EVALUATED

Based on scoping and agency consultation, as well as the alternatives formulation and evaluation process conducted by the SERP Subcommittee, the following program alternatives were identified for evaluation in this DEIR:

- ▶ **No-Project Alternative**—CEQA Guidelines section 15126.6(e)(2) states that a discussion of the “No Project” alternative must consider “what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans.” The No-Project Alternative assumes that the SERP would not be initiated, and no collaborative programmatic repair program would be put in place by DWR. Instead, erosion repairs would continue to be identified by DWR, permitted individually by the applicable regulatory agencies, and implemented when permits were obtained, as is currently done. DWR would continue the status quo, implementing a range of unrelated erosion repairs on a project-by-project basis.

Under this alternative, a number of minor repairs would be conducted by various maintenance yards, and would qualify as categorical exemptions under CEQA. Therefore, by definition, these minor repairs would have less-than-significant impacts on the physical environment. DWR would also typically be able to complete CEQA evaluations and obtain federal and state agency authorizations each year to repair one or two levee sections that meet the size requirements of SERP under this alternative. The agency authorizations obtained through this process would stipulate avoidance, minimization, conservation, and compensation measures to reduce potentially significant impacts on the environment to a less-than-significant level. However, more repairs than these would be needed each year. Because of the lengthy process associated with CEQA compliance and permit acquisition,

a number of these sites would be left unrepaired and would likely be further eroded during severe weather patterns. This would result in the need for more emergency repairs each year relative to the proposed project, and emergency repairs would be made using only rock. The No-Project Alternative would not meet most DWR project objectives and was determined to be infeasible. It was included in the analysis, however, as required by CEQA Guidelines section 15126(e).

- ▶ **Large-Scale Erosion Repair Program Alternative**—A large-scale programmatic erosion repair program would be developed, similar to the SERP, to permit one to three projects per year, with a combined maximum area or length of disturbance equal to the SERP. Therefore, the Large-Scale Erosion Repair Program in a given year could include one project with up to 7.5 acres or 15,000 linear feet in size, or two to three individual projects of any size, as long as the maximum combined area or length permitted in that year did not exceed 7.5 acres or 15,000 linear feet. The bioengineering designs proposed under the SERP could be used for the Large-Scale Erosion Repair Program Alternative, but at a larger scale. Construction equipment and methods would be similar to the proposed program. This alternative meets most project objectives and is considered to be a feasible alternative.
- ▶ **Native Soil Disturbance Minimization Alternative**—This alternative would permit the same number of erosion repair projects as the SERP (up to 15), with the same acreage and linear-foot limitations per site as the SERP, but in areas where disturbance of native soil for site preparation could be avoided, revetment could be installed directly on the native soil with no grading or excavating required, and plantings would be permitted only in the levee fill. Under this alternative, disturbance of native soil would not be precluded where the erosion repair required the disturbance of this soil to ensure efficacy of the design from an engineering standpoint; however, erosion repair methods not requiring disturbance of native soil would be favored. The same number of acres or linear feet of disturbance would occur under this alternative as under the SERP, but some of the repairs would avoid disturbance of native soil. In these cases, because vegetation planting would be restricted to levee fill, the repairs would generally result in vegetation plantings farther away from the aquatic habitat than would occur under the SERP. Construction equipment and methods would be similar to the proposed program except as described above. This alternative meets most project objectives and is considered to be a feasible alternative.

4.3.2 ANALYSIS OF ALTERNATIVES EVALUATED

A qualitative analysis addressing each environmental resource evaluated in the DEIR is discussed next for each of the three alternatives to the proposed program. The analysis is comparative, identifying whether the alternative would result in a “greater,” “lesser,” or “similar”

impact relative to the proposed program, shown in brackets at the end of the discussion for each resource.

No-PROJECT ALTERNATIVE

Air Quality and Climate Change

Implementation of the No-Project Alternative would maintain the status quo. Minor erosion repair projects would be implemented by maintenance yards through categorical exemptions under CEQA and would not require resource agency authorizations; although larger erosion repair projects would be required to obtain resource agency authorizations before repairs could be performed because of their potential impact on the environment. Air quality and climate change impacts associated with implementing these types of erosion repairs are expected to be similar to that described for the proposed program. As discussed in Section 3.2, “Air Quality and Climate Change,” a single repair project would result in emissions of nitrogen oxides (NO_x) that would exceed the local Feather River AQMD and Butte County AQMD thresholds of significance for NO_x. Emissions of reactive organic gases (ROG), respirable particulate matter less than or equal to 10 microns in diameter (PM₁₀), and fine particulate matter less than or equal to 2.5 microns in diameter (PM_{2.5}) would not exceed local Feather River AQMD standards with implementation of the rules and measures required in the various jurisdictions. In addition, as discussed in Section 5.1.5, “Analysis of Cumulative Impacts,” greenhouse gas (GHG) emissions associated with construction of repairs would be minimal, would occur over a limited duration, and would be reduced below business-as-usual, project-related GHG emissions. However, under both the SERP and the No-Project Alternative, impacts associated with these types of projects would be similar because mitigation could be applied to each project to reduce air quality and climate change impacts to a less-than-significant level. On the other hand, delays associated with the CEQA compliance and permitting processes under the No-Project Alternative also could increase the number and extent of emergency repairs, which, because of the imminent flood threat, would be conducted without mitigation measures to reduce potential impacts to air quality to a less-than-significant level. Consequently, impacts to air quality, including greenhouse gas emissions, may not be reduced to less than significant in some circumstances. In the event of a flood, which is increased under the No-Project Alternative, air quality impacts would be substantial because of the increased construction activities. *[Greater]*

Biological Resources

Implementation of the No-Project Alternative would maintain the status quo. Minor erosion repair projects would be implemented by maintenance yards through categorical exemptions under CEQA and would not require resource agency authorizations; although larger erosion repair projects would be required to obtain resource agency authorizations before repairs could be performed because of their potential impact on the environment. Construction-related

impacts on biological resources under the No-Project Alternative would be less than significant because either (1) the size of the repair would be so small that no possibility would exist for the repair to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or substantially reduce the number or restrict the range of a rare or endangered plant or animal, or (2) multiple authorizations and interagency coordination would be required before repairs could occur and such authorizations would stipulate avoidance, minimization, conservation, or compensation measures that would reduce potential impacts on biological resources to a less-than-significant level. Therefore, continued actions taken by DWR to repair erosion sites would not result in significant impacts to biological resources.

Although repair actions may not result in significant impacts to biological resources under the No-Project Alternative, projects that would require multiple authorizations and interagency coordination could experience delays in implementing repairs, during which time the eroded areas may worsen (expand in size or severity), thereby jeopardizing public safety by increasing flood risk and potentially adversely affecting riparian vegetation and endangered species habitat. Although the degree to which continued erosion at these sites would impact biological resources is unknown, it would be greater than under the SERP because repairs could involve greater and more complex construction methods as eroded areas worsen. Delays also could necessitate more emergency repairs, which may be permitted without avoidance, minimization, conservation, or compensation measures to reduce potential impacts to biological resources to a less-than-significant level. Although after-the-fact compensatory mitigation may be required to offset impacts that occurred during emergency repair activities, this mitigation may not be adequate to fully offset impacts that occurred to biological resources during the emergency repair. Consequently, impacts to biological resources may not be reduced to less than significant in some circumstances. *[Greater]*

Cultural Resources

Under the No-Project Alternative, maintenance yards would identify and implement minor erosion repairs that would qualify under a CEQA categorical exemption, and larger erosion repairs at individual sites would be permitted on a project-by-project basis. The sites that would qualify for a categorical exemption under CEQA would, by definition, not have the potential to result in significant impacts. The minor erosion repairs would be highly unlikely to have significant impacts on cultural resources because they typically would not involve the disturbance of native soils, substantially reducing the possibility of disturbing a significant prehistoric or historic archeological resource. Like the proposed program, the larger erosion repairs permitted on a project-by-project basis under the No-Project Alternative would require disturbance of native soil. This would increase the possibility of modifying important examples of California history or prehistory. Section 106 NHPA consultation could occur if these large

repairs triggered the involvement of a federal agency (e.g., USACE Clean Water Act authorization), resulting in a Memorandum of Agreement (MOA) or a Programmatic Agreement (PA) that stipulates measures to treat any significant cultural resource. The probability and severity of this impact would be similar to that anticipated under the SERP. *[Similar]*

Under the No-Project Alternative, obtaining authorizations and completing resource agency consultations required for some erosion repair sites would take time, potentially causing the erosion sites to increase in size and severity, thereby increasing flood risk. Although the degree to which continued erosion at sites awaiting repair authorizations and coordination with the resource agencies would increase impacts related to known and previously undiscovered cultural resources cannot be determined, the overall impact likely would be greater than under the SERP. Delays associated with the CEQA compliance and permitting processes under the No-Project Alternative also could increase the number and extent of emergency repairs, which, because of the imminent flood threat, would be conducted without mitigation measures to reduce potential impacts to cultural resources to a less-than-significant level. Consequently, impacts to cultural resources may not be reduced to less than significant in some circumstances. *[Greater]*

Geology, Soils, and Paleontological Resources

As stated above, under the No-Project Alternative, minor repairs would be implemented by maintenance yards with categorical exemptions under CEQA, but larger erosion repair projects would be required to obtain resource agency authorizations before repairs could be performed because of the potential to impact the environment. The sites that would qualify for a categorical exemption under CEQA would, by definition, not have the potential to result in significant impacts related to geology, soils, and paleontological resources. For larger erosion sites where multiple authorizations and interagency coordination would be required before repair, the repairs would be required to be engineered to current levee design standards to address soil conditions and the level of probable ground shaking. Like the SERP, authorizations also would require development and implementation of erosion control plans and storm water pollution prevention plans, incorporating site and project-specific best management practices to prevent erosion and loss of topsoil, and this would reduce potential impacts to geology and soils to a less-than-significant level.

However, as discussed previously, the need for multiple authorizations and interagency coordination may cause delays in implementing repairs, during which time erosion repair sites may increase in size and severity, thereby jeopardizing public safety by increasing flood risk. Although the degree to which continued erosion at sites awaiting repair authorizations and coordination with the resource agencies would increase impacts related to geology, soils, and paleontological resources is unknown, the overall impact likely would be greater than under the SERP. Delays associated with the CEQA compliance and permitting processes under the No-

Project Alternative also could increase the number and extent of emergency repairs, which, because of the imminent flood threat, would be conducted without mitigation measures to reduce potential impacts related to geology, soils, and paleontological resources to a less-than-significant level. Consequently, impacts to geology, soils, and paleontological resources may not be reduced to less than significant in some circumstances. *[Greater]*

Hydrology and Water Quality

A major consequence of erosion sites within levee systems is the deposition of soil and associated contaminants into waterways. Soil and associated contaminants that enter receiving water through stormwater runoff and erosion can increase turbidity, stimulate algal growth, increase sedimentation of aquatic habitat, and introduce compounds that are toxic to aquatic organisms. Although soil erosion and the subsequent effect on water quality are inevitable within a levee system, without a program-level permit that would allow for expedited response to small erosion sites, the length of time in which soil and associated contaminants could enter waterways would increase. Erosion sites grow larger over time, and soil becomes less stable within alternating periods of high and low flows, depositing soil into waterways, and thereby affecting water quality. Therefore, water quality impacts under the No-Project Alternative likely would be greater than under the SERP. Delays associated with the CEQA compliance and permitting processes under the No-Project Alternative also could increase the number and extent of emergency repairs, which, because of the imminent flood threat, would be conducted without mitigation measures to reduce potential impacts to hydrology and water quality to a less-than-significant level. Consequently, impacts to hydrology and water quality may not be reduced to less than significant in some circumstances. *[Greater]*

Noise

Implementation of the No-Project Alternative would maintain the status quo. Minor erosion repair projects would be implemented by maintenance yards through categorical exemptions under CEQA and would not require resource agency authorizations; although larger erosion repair projects would be required to obtain resource agency authorizations before repairs could be performed because of their potential impact on the environment. The number of small erosion sites requiring repairs under the No-Project Alternative would be the same as under the proposed program. The noise impacts associated with implementation of these repairs would be similar to those discussed for the SERP. Therefore, although construction traffic could cause a potentially significant impact from noise, noise impacts associated with construction activities could be decreased to a less-than-significant level with implementation of Mitigation Measure 3.7-1, "Implement Measures to Reduce Temporary Noise Levels from Construction of the SERP." Under both the SERP and the No-Project Alternative, temporary noise-related impacts associated with these types of projects would be reduced because traffic routes would be identified for each specific project, and this mitigation would reduce impacts to

a less-than-significant level. On the other hand, delays associated with the CEQA compliance and permitting processes under the No-Project Alternative also could increase the number and extent of emergency repairs, which, because of the imminent flood threat, would be conducted without mitigation measures to reduce potential noise impacts to a less-than-significant level. Consequently, noise impacts may not be reduced to less than significant in some circumstances. *[Greater]*

Impact Summary

Under the No-Project Alternative, impacts would be greater than those under the SERP for air quality and climate change; biological resources; cultural resources; geology, soils, and paleontological resources; hydrology and water quality; and noise.

LARGE-SCALE EROSION REPAIR PROGRAM ALTERNATIVE

Air Quality and Climate Change

The types of impacts on air quality and climate change under the Large-Scale Erosion Repair Alternative would be similar to those described under the SERP. Construction-related emissions from a single erosion site repair would result in emissions of NO_x that would exceed the local Feather River AQMD and Butte County AQMD threshold of significance. The larger erosion repairs would have a similar impact on air quality and climate change as the repairs under the SERP. The same mitigation that would be applied to the SERP to reduce emissions of NO_x to a less-than-significant level would be applicable under this alternative. Construction-related emissions of ROG, NO_x, PM₁₀, and PM_{2.5} would be less than significant. *[Similar]*

Biological Resources

Impacts on biological resources would be mitigated in the same manner as under the SERP. Self-mitigating design templates would be used, and environmental commitments to biological resources would be incorporated for each project. The Large-Scale Erosion Repair Program Alternative would, however, require Clean Water Act section 404 permits and section 401 certifications, Endangered Species Act consultations, and streambed alteration agreements on a project-by-project basis. Additionally, the larger projects likely would not qualify as routine maintenance, and therefore may require encroachment permits from the CVFPB. The permitting agencies would review each project, including the environmental commitments, and could require additional avoidance, minimization, conservation, or compensation as stipulations to any authorizations provided for a project. Temporary construction impacts to special-status plant and wildlife species and their habitats could occur for a longer duration than under the SERP because of the increased magnitude of the repair project(s). Because the Large-Scale Erosion Repair Program Alternative would include environmental commitments, self-mitigating design templates, and possibly the implementation of additional

avoidance, minimization, conservation, or compensation as stipulated by the resource agencies, construction would have a less-than-significant impact on biological resources. However, because the construction could take longer than under the SERP, the temporal impacts are considered greater than those of the SERP.

Delays to repairs of larger erosion sites could occur as a result of the project-by-project permitting, including ESA consultations, during which time the eroded areas would be susceptible to further damage. Destruction of habitat could be exacerbated as a result of ongoing erosion, as under existing conditions. Whether consultations would result in avoidance, minimization, and compensation measures that would be adequate to address these original impacts cannot be determined because the additional damage would be the result of erosion that occurred during the permitting process, not resulting from the action of the entity doing the repairs. Therefore, this impact could be greater than that generated under the SERP. *[Greater]*

Cultural Resources

Like the SERP, this alternative would require disturbance of native soil. This would increase the possibility of modifying important examples of California history or prehistory. Impacts on cultural resources would be mitigated in the same manner as under the SERP. Section 106 NHPA consultation would occur resulting in a MOA or a PA with stipulations to treat any significant cultural resource. The potential for modification of a significant resource, such as a shipwreck or a prehistoric archaeological site, would be similar to that under the SERP.

However, the permitting process for the Large-Scale Erosion Repair Alternative would not be as simplified as for the SERP; therefore, larger sites needing repair could continue to erode for a longer period of time, which could result in greater damage to identified and unidentified cultural resources at those individual repair sites. *[Greater]*

Geology, Soils, and Paleontological Resources

Under the Large-Scale Erosion Repair Alternative, repair of larger erosion sites would continue at the same rate and extent as under existing conditions because permitting would still be necessary on a site-by-site basis. During this extended period of consultation, eroded areas would be susceptible to further damage and increased soil erosion. Although the degree to which soil erosion would increase during authorization and coordination activities cannot be determined, it likely would be greater than under the SERP. In addition, repair of larger erosion sites would increase the potential for disturbance of paleontological resources. *[Greater]*

Hydrology and Water Quality

As discussed previously, a major consequence of erosion within levee systems is the deposition of soil and associated contaminants into waterways. Soil and associated

contaminants that enter receiving water through stormwater runoff and erosion can increase turbidity, stimulate algae growth, increase sedimentation of aquatic habitat, and introduce compounds that are toxic to aquatic organisms. Although soil erosion and the subsequent effect on water quality would be inevitable within a levee system, without a program-level permit that would allow for expedited response to small erosion sites, the length of time in which soil and associated contaminants could enter waterways would be increased. Therefore, the severity of this impact would be greater than under the SERP. *[Greater]*

Noise

Construction traffic could cause greater noise impacts at sensitive receptors under the Large-scale Erosion Repair Program Alternative because more trips would be concentrated in a single area, rather than dispersing trips among several projects and locations. Furthermore, larger erosion sites would have additional staging areas and haul routes in a single project area and would be likely to require longer construction periods than under the SERP, thereby increasing the potential for noise impacts. The noise reduction measures for the SERP (i.e., Mitigation Measure 3.7-1, “Implement Measures to Reduce Temporary Noise Levels from Construction of the SERP”) also would be applicable to the Large-scale Erosion Repair Program Alternative. With implementation of these mitigation measures, noise impacts associated with construction activities would decrease to a less-than-significant level. However, the noise effects at nearby sensitive receptors could still be greater than that under the SERP. *[Greater]*

Impact Summary

Under the Large-Scale Erosion Repair Program Alternative, impacts to environmental resources addressed in this DEIR would be greater than under the SERP: biological resources; cultural resources; geology, soils, and paleontological resources; hydrology and water quality; and noise. Air quality and climate change impacts would be similar.

NATIVE SOIL DISTURBANCE MINIMIZATION ALTERNATIVE

The Native Soil Disturbance Minimization Alternative would have the same effects as the SERP, with the exception that in areas where avoiding disturbance of native soil for site preparation would be feasible, revetment would be installed directly on the native soil with no grading or excavating, and any vegetation plantings would occur only in levee fill. Because of only the minor difference between these two alternatives, impacts to air quality and climate change; geology, soils, and paleontological resources; hydrology and water quality; and noise clearly would be similar, and thus these issues are not evaluated further. This alternatives discussion focuses on biological resources and cultural resources, and areas of meaningful differences between the two alternatives.

Biological Resources

Impacts on biological resources under the Native Soil Disturbance Minimization Alternative would be mitigated in the same manner as under the SERP, except that the level of habitat enhancement achieved may not be as great because some designs would offer less opportunity to create in-water and woody shaded riverine habitat. Therefore, although the potential impacts to biological resources would be similar to that under the SERP, the degree of habitat enhancement under this alternative would be somewhat reduced overall, and more off-site and/or compensatory mitigation measures likely would be needed relative to the SERP. Therefore, impacts to biological resources are considered greater under this alternative than under the SERP. *[Greater]*

Cultural Resources

Avoiding disturbance of native soil would reduce potential impacts on significant historic and prehistoric archeological resources. Because this alternative would not completely restrict disturbance of native soil, allowing for grading and excavation of the repair site when required to ensure efficacy of the design, the potential would continue to exist for the adverse modification of a significant historic or prehistoric archeological resource. However, this potential would be reduced under the Native Soil Disturbance Minimization Alternative relative to the SERP. *[Lesser]*

Impact Summary

Under the Native Soil Disturbance Minimization Alternative, impacts would be similar to those under the SERP for air quality and climate change; geology, soils, and paleontological resources; hydrology and water quality; and noise; greater for biological resources; and less for cultural resources.

4.4 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The CEQA Guidelines require identification of an environmentally superior alternative. In general, the environmentally superior alternative is the alternative that would generate the fewest or least severe adverse impacts on the environment. If the No-Project Alternative is environmentally superior, CEQA requires identification of the “environmentally superior alternative other than the no project alternative,” among the alternatives evaluated.

Table 4-2 identifies whether each of the alternatives would have “greater,” “lesser,” or “similar” impacts relative to the SERP for each of the environmental resources evaluated in this DEIR.

Overall, the proposed program would have the least environmental impacts of the alternatives. Small erosion sites would be repaired efficiently and more quickly, thereby minimizing further

**Table 4-2
Comparison of Proposed Program and Alternatives Impact Levels**

Environmental Resource	Proposed Program	No-Project Alternative	Large-Scale Repair Program Alternative	Native Soil Disturbance Minimization Alternative
Air Quality and Climate Change	Less than significant after mitigation	Greater	Similar	Similar
Biological Resources	Less than significant	Greater	Greater	Greater
Cultural Resources	Less than significant after mitigation	Greater	Greater	Lesser
Geology, Soils, and Paleontological Resources	Less than significant	Greater	Greater	Similar
Hydrology and Water Quality	Less than significant	Greater	Greater	Similar
Noise	Less than significant after mitigation	Greater	Greater	Similar

Source: Compiled by AECOM in 2011

ongoing erosion at the sites. Furthermore, project implementation would include features that would enhance and monitor riparian vegetation, where feasible.

Although the Native Soil Disturbance Minimization Alternative also would provide for some enhancement of riparian vegetation and would have less potential to impact cultural resources, impacts to cultural resources still would be potentially significant without mitigation, and this alternative would be likely to require more off-site compensatory mitigation than the proposed program.

Off-site compensatory mitigation, although providing benefits to biological resources (e.g., connectivity of habitat), does not enhance the existing riparian and endangered species habitat on-site, and whether greater benefits would occur to biological resources off-site cannot be determined. In addition, USFWS, NMFS, and CDFW strongly prefer on-site mitigation to off-site mitigation. Under the No-Project Alternative, the time required to obtain the necessary permits could be substantial, which could result in continued severe erosion and delays in providing flood risk reduction to the public. This increased erosion could result in increased impacts on biological resources; geology, soils, and paleontological resources; and hydrology and water quality, which would be greater than those under the SERP.

Delays to repairs also would occur under the Large-Scale Erosion Repair Program Alternative, resulting in similar impacts as under the No-Project Alternative and greater impacts compared to the SERP. The SERP would include a streamlined permitting process for erosion sites and a

habitat component that would minimize the loss of riparian vegetation and enhance habitat where possible. The No-Project Alternative, Large-Scale Erosion Repair Alternative, or Native Soil Disturbance Minimization Alternative would have greater overall impacts than the SERP.

Although the Native Soil Disturbance Minimization Alternative would generally meet the objectives identified by DWR and the SERP Subcommittee for the program, the SERP would meet all objectives and provide comparatively more opportunity for habitat enhancement. The SERP would help maintain the flood management integrity of the SRFCP, prevent further erosion at identified erosion sites, minimize the loss of riparian vegetation, and enhance the riparian vegetation corridor, where feasible. Thus, the SERP is the environmentally superior alternative.

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